UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,562	10/15/2004	Aaron Reel Bouillett	PU020123	4174

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EXAMINER
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ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/511,562	BOUILLETT, AARON REEL
	Examiner	Art Unit	
	LEON-VIET Q. NGUYEN	2611	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>11 February 2008</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-18 and 24-26</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-18 and 24-26</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>15 October 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   This office action is in response to communication filed on 2/11/08.

Claims 1-18 and 24-26 are pending on this application.

2.   Applicant's arguments, see Remarks, filed 2/11/08, with respect to the

rejection(s) of claim(s) 1-18 and 24-26 under 35 USC 103(a) have been fully

considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in

view of Xia et al (US20040091039), Ogawa et al (US5781463), Nam

(US6515713), Nozue (US4697265), and Strolle et al (US5835532).

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

2.   Claims 1, 3, 4, 10-12, 18 and 24 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Xia et al (US20040091039).

        Re claim 1, Xia teaches an apparatus for determining convergence of an

equalizer, comprising:

        an equalizer output signal (the output from equalizer 224 in fig. 7); and

a nearest element decision device (slicer 226 in fig. 7), the nearest element decision device receiving the equalizer output signal (the output from 224 to 226 in fig. 7) and creating a decision device output signal containing permissible symbol values of a symbol constellation used in transmission of a signal to the apparatus (¶0013-¶0014).

a monitoring circuit (blocks 719 and 723 in fig. 7), the monitoring circuit receiving an output signal (fig. 7, the output of slicer 226) and determining equalizer convergence (¶0042).

Xia fails to explicitly teach applying a test criterion to data contained in the decision device output signal. However Xia teaches that the equalizer will not converge if the slicer 226 has an error rate greater than 0.1 (¶0021). It would be obvious to one of ordinary skill in the art that some test would be required to determine if the error rate is greater than 0.1. Furthermore, one of ordinary skill would realize that there would be some test criteria to determine what the necessary step size would need to be adjusted to for convergence (¶0042-¶0043). The motivation to have the test criterion would be to all the equalizer to use a lower resolution and simpler hardware (¶0043).

Re claim 3, Xia teaches an apparatus wherein the nearest element decision device is a slicer (226 in fig. 8).

Re claim 4, Xia teaches an apparatus wherein the monitoring circuit receives (blocks 719 and 723 in fig. 7) the decision device output signal for a predetermined period of time (fig. 5, ¶0019, each stage corresponds to a sampling time) representing an acquisition of a desired number of transmitted symbol values (¶0014).

Re claim 10, Xia teaches an apparatus wherein the equalizer output signal includes an image representative datastream containing data packets (¶0001, the equalizer is used in video communications).

Re claim 11, although Xia does not explicitly teach an apparatus wherein the monitoring circuit is a microprocessor, it would be obvious that elements 719 and 723 in fig. 7 would be microprocessors.

Re claim 12, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 1. Furthermore Xia teaches where the system receives a VSB signal (¶0014) represented by a multiple level constellation (¶0017). Although Xia does not explicitly teach having a data frame format constituted by a succession of data frames, it would be necessary for a television receiver to receive data images in succession.

Re claim 18, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 11.

Re claim 24, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 1.

3.   Claims 2, 5-7, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xia et al (US20040091039) in view of Ogawa et al (US5781463).

Re claim 2, Xia fails to teach an apparatus wherein the equalizer is formed to include an infinite impulse response filter. However Ogawa teaches an apparatus wherein the equalizer is formed to include an infinite impulse response filter (2 in fig. 8).

Therefore taking the combined teachings of Xia and Ogawa as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the features of Ogawa into the apparatus of Xia. The motivation to combine Xia and Ogawa would be to suppress linear noise caused by a calculation process (col. 18 lines 59-65).

Re claim 5, Xia fails to teach an apparatus further comprising a memory, the memory being coupled to the monitoring circuit and being adapted to store decision device output data and test criteria. However Ogawa teaches an apparatus further comprising a memory (fig. 5), the memory being coupled to the monitoring circuit and being adapted to store decision device output data and test criteria (col. 14 lines 17-20).

Therefore taking the combined teachings of Xia and Ogawa as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the features of Ogawa into the apparatus of Xia. The motivation to combine Xia and Ogawa would be to shorten the time it takes to calculate convergence (col. 14 lines 1-3).

Re claim 6, the modified invention of Xia teaches an apparatus wherein the test criteria for determining equalizer convergence includes identifying a desired sample of transmitted symbol values (¶0014 of Xia).

Re claim 7, the modified invention of Xia teaches an apparatus wherein the desired sample of transmitted symbol values includes at least one of every possible symbol value (¶0014 of Xia).

Re claims 15 and 17, the modified invention of Ogawa teaches a system wherein the test criteria for determining convergence requires identifying at least some transmitted symbol values (col. 16 lines 58-63 of Ogawa).

Re claim 16, the claim limitations as recited have been analyzed and addressed in the above rejections with respect to claim 2.

4.   **Claims 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xia et al (US20040091039) and Ogawa et al (US5781463) in view of Nam (US6515713).**

Re claim 8, the modified invention of Xia teaches an apparatus wherein the monitoring circuit is coupled to the equalizer (the output of slicer 226 coupled to monitoring circuit formed by blocks 719 and 723 in fig. 7 of Xia), but fails to teach the monitoring circuit resetting the equalizer when the equalizer diverges. However Nam teaches resetting an equalizer when the equalizer is diverged (col. 2 lines 14-18).

Therefore taking the modified teachings of Xia and Ogawa with Nam as whole at the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the method of resetting an equalizer of Nam into the receiver of Xia and Ogawa to compensate for channel distortion and perform stable equalization (col. 2 lines 14-18).

Re claim 13, the claim limitations as recited have been analyzed and
addressed in the above rejections with respect to claim 8.

5.   **Claims 9 and 14 are rejected under 35 U.S.C. 103(a) as being
unpatentable over Xia et al (US20040091039) and Ogawa et al (US5781463)
in view of Nozue (US4697265).**

Re claim 9, the modified invention of Xia teaches an apparatus wherein
the monitoring circuit is coupled to the equalizer (the output of slicer 226 coupled
to monitoring circuit formed by blocks 719 and 723 in fig. 7 of Xia), but fails to
teach the monitoring circuit resetting the equalizer when the equalizer achieves
an invalid state. However Nozue teaches resetting an equalizer if the error rate
for some received data becomes too high and exceeds a specific value (col. 1
lines 29-34).

Therefore taking the combined teachings of Ogawa and Nozue as whole
at the time the invention was made, it would have been obvious to one of
ordinary skill in the art to combine the method of resetting an equalizer of Nozue
into the receiver of Ogawa to prevent divergence of the equalizer (col. 1 line 34).

Re claim 14, the claim limitations as recited have been analyzed and
addressed in the above rejections with respect to claim 9.

6.   **Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being**
unpatentable over Xia et al (US20040091039) in view of Strolle et al
(US5835532).

Re claim 25, Xia fails to teach a method wherein the constellation comprises an alphabet of N symbols, where N > 1, and the testing step determines that the equalizer is converged if at least M of the N symbols of the alphabet are represented in the plurality of symbols, where M > 1.

However Strolle teaches wherein the constellation comprises an alphabet of N symbols, where N > 1, (col. 6 lines 31-47) and the testing step determines that the equalizer is converged if at least M of the N symbols of the alphabet are represented in the plurality of symbols, where M > 1 (fig. 4, col. 8 lines 41-43, covering the full 8-VSB constellation means each of the 8 symbols of the constellation is represented).

Therefore taking the combined teachings of Xia and Strolle as whole at the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the method of Strolle into the method of Xia. The motivation to combine Strolle and Xia would be to provide finer resolution (col. 3 lines 7-10).

Re claim 26, Xia fails to teach a method wherein M equals N. However Strolle teaches where M equals N (fig. 4, the third clusters and the respective decision device outputs).

Therefore taking the combined teachings of Xia and Strolle as whole at the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the method of Strolle into the method of Xia. The motivation to combine Strolle and Xia would be to provide finer resolution (col. 3 lines 7-10).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEON-VIET Q. NGUYEN whose telephone number is (571)270-1185. The examiner can normally be reached on monday-friday, alternate friday off, 7:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon-Viet Q Nguyen/
Examiner, Art Unit 2611

/David C. Payne/

Supervisory Patent Examiner, Art Unit 2611